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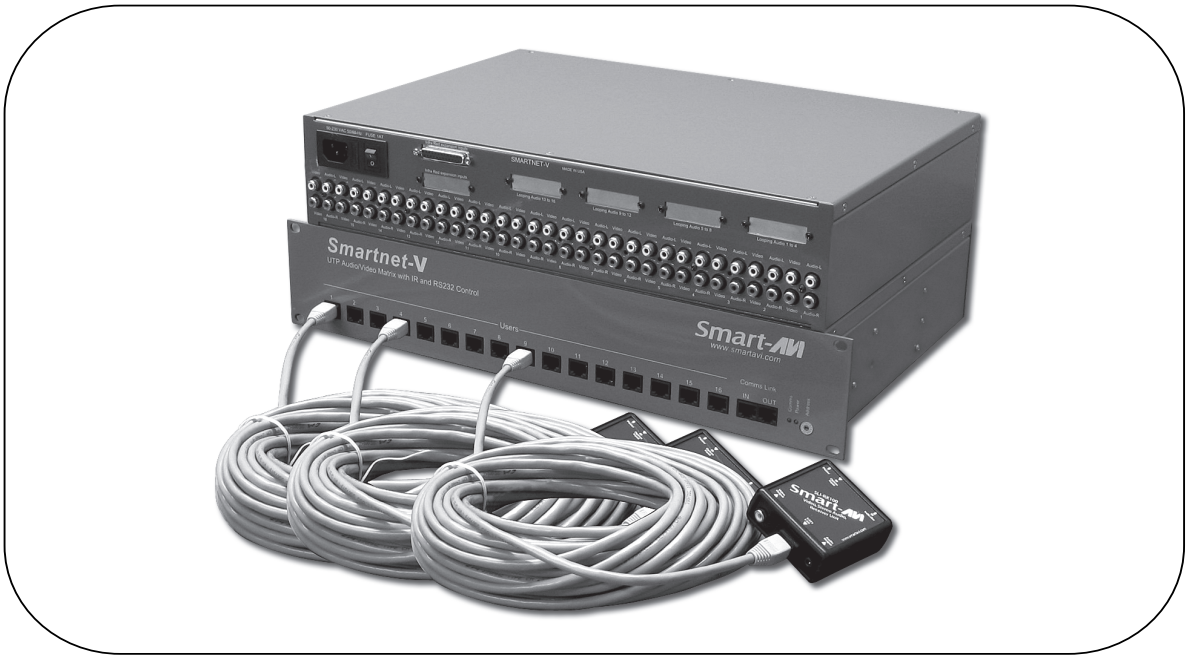
Smart-AVI

Smart Audio Video Integration

User Manual

SmartNet-V



High quality Composite Audio/Video matrix that distributes signals via CAT5. Controlled via infrared control and computer.

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Chapter 1: Introduction

Overview

Sometimes AV signals need to be transmitted over long distances, sometimes greater than commonly specified product limitations of 15 feet. In this case several choices are available, but most are expensive and bulky, which is some cases is simply not practical, due to space limitations in the conduits

The SmartNet-V is a high-quality switching matrix for composite video signals. This basic signal format is widely used by many viideo products..Standard RCA connectors are used for the input as well as the output video signal. All that is required is a standard RCA video cable to connect to the signal source.

The units contain a very high bandwidth routing matrix for the Red, Green and Blue video channels and separate switching layers for Horizontal and Vertical Syncs. The color signals are balanced internally and combined with the syncs. This combined signal is then driven out through standard RJ45s on the front panel. Standard SmartAVI VGA receiver units are used at the end of each CAT 5 cable to recover the signals. High quality receiver circuits incorporating cable loss compensation provide excellent results up to resolutions of 1600 x 1200 @85Hz.Compatible with all types of UTP and STP cable, the receivers can have optional internal skew compensation fitted, which solves the problem of delay errors found in the higher specification structured cabling.

Applications

- Wall Displays
- Audio Visual Presentation
- Digital media
- Shopping centers
- Airports
- Security
- Dealer Rooms
- Point of sale
- Control rooms
- Hotels

What's in the box:

SmartNet-V Package Contents		
QTY	Item	Part No.
1	SmartNet-V Router	SNV-*X*
1	Power Cord	CC-PWR06-US
1	RS232 to RS422 adapter	SM-R232R422
1	RS422 to RJ45 adapter	SM-RJ45RS422

*Depending on the model you have this may be a combination of 8, 12, or 16.

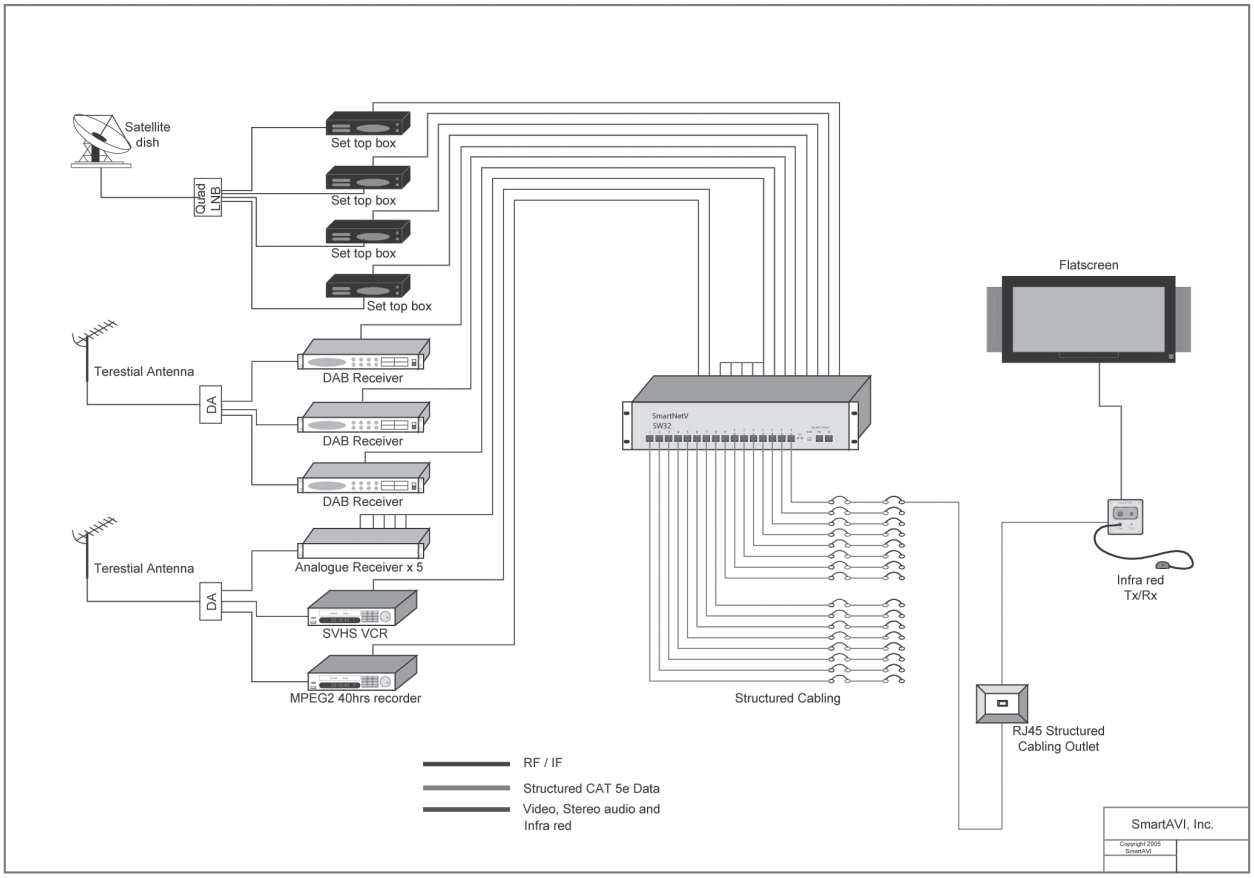
Optional Accessories		
QTY	Item	Part No.
1	Audio Cable (3.5mm to RCA Left and Right)	CC-MRAMM-06
1	Remote Control Unit	SM-RMT
1	IR Blaster	SM-16B
1	IR Emitter	SM-LED
1	IR Eye	SM-EYE

Connecting the SmartNet-V (Quick Start)

Warning: As a precaution, we recommend that you disconnect all power cords and make sure that all devices are turned off.

1. Plug in all external audio/video sources to the back of the SmartNet-V.
2. Connect CAT5 (UTP) cables to the front of the unit and route the cables to the desired location
3. Connect the receiver unit (SLI-RX100) to the end of the CAT5 cable.
4. Connect Output monitor and speakers to the receiver Units.
5. Connect RS232/RS422 adapter to the male serial port on your computer. Then connect the RS422/RJ45 adapter to that first adapter
6. Use CAT5 cable to connect the adapters (from computer) to the IN terminal (CAT5) on the front panel of the SmartNet-V unit.
7. Plug in all power adapters to the receivers as well as the SmartNet-V unit.
8. Install SmartControl software.
9. Power on the SmartNet-V Router.

Note: 2 adapters will be connected together. This is normal. RS232 to RS422 to RJ45.



Connecting the SmartNet-V (Detailed Instructions)

Video and Audio Inputs

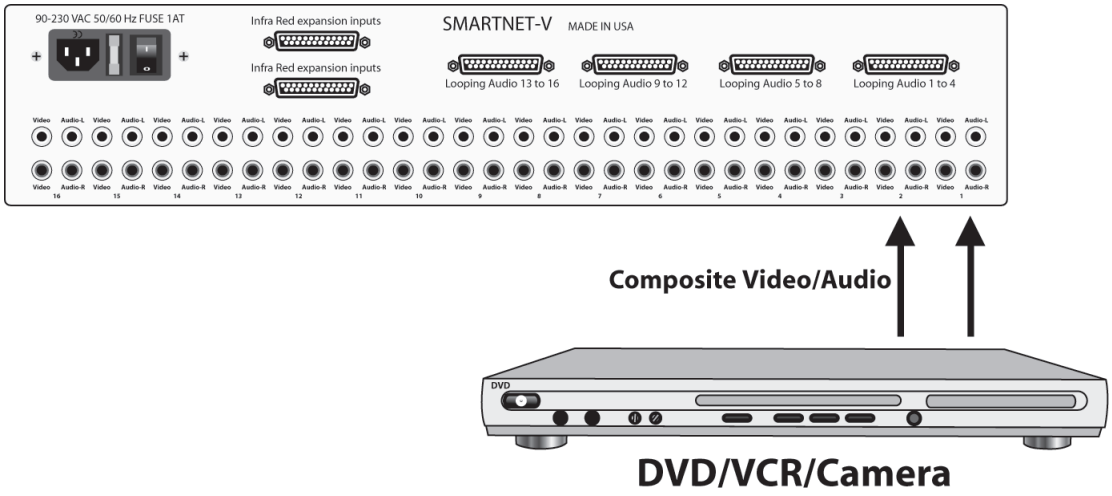
The video input for the SmartNet-V is a standard RCA composite connection.

Connect all of the Input video sources to the back of the SmartNet-V unit.
Hint: You may want to label the input video connections so as not to lose track of where the signal is coming from. Later on when the software is installed you will be able to give each connection a name and the software will remember it for you. This way you can switch the video connections without having to look at the physical connections on the back of the unit. (You can also use the included page at the end of this manual in order to keep track of the connections as you make them.)

The audio inputs for the SmartNet-V are standard RCA stereo connectors.

Connect all of the audio inputs to the back of the SmartNet-V unit. Most audio sources usethis standard connection but there is other equipment such as computers where a special adapter cable will be needed. Such as a 3.5mm miniplug to stereo RCA cable.

Make sure that the audio and video are coming from the same source and are plugged in within the same set of RCA connectors. For example. The audio from one computer should have its video plugged in right next to it.



Connecting the Communication Cable: RS422

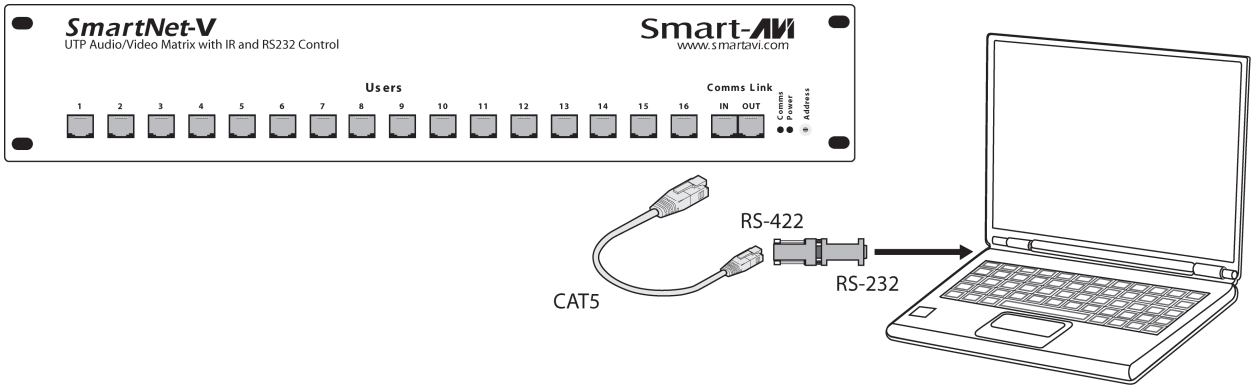
Each unit can be controlled by a RS422 port connected via a RJ45 on the front of the chassis. Two connectors are provided for expansion, allowing a simple Cat 5 patch cable to link to additional units. An adjustable rotary switch allows each unit to be assigned a unique ID, read when the unit is first powered up. The SmartControl software will be used to control the units.

Note: In addition to the centralized control from a computer, each output can be selected individually. The receiver unit either has an internal IR decoder or and optional external IR decoder. Using a handset or other third party system each output can be selected by simply pressing the appropriate number corresponding to the input number.

There are 2 adapters:

- RS232 to RS422 adapter (Connects to the serial port on your computer)
- RS422 to RJ45 adapter (Connects to the other adapter as well as SmartNet-X Unit)

1. Connect the RS232 to RS422 adapter into the control computer by connecting the female RS232 connector into the male RS232 connector of the PC. Turn the side screws so that it does not accidentally become disconnected
2. Connect the RS422 to RJ45 adapter to the other adapter by connecting the female end into the male connector of the other adapter.
3. Run a single UTP CAT5 cable from this connector to the front of the SmartNet-V unit.
4. Connect CAT5 connector to the COMMS connector labeled IN.



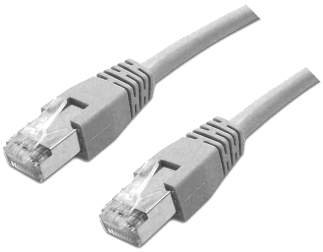
Preparing the Cat5 Cable

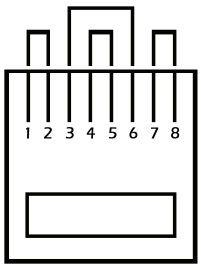
The SmartNet-V transmitter with its receiver utilizes category 5 (CAT 5), unshielded twisted pair (UTP) cable to transport signal between transmitter and receiver.

CAT 5 cable is more desirable than coaxial cable due to its low cost and eases of installation. This cable is used for LAN applications and is found in abundance, already installed, in many buildings. The category 5 is a standard which establishes minimum requirements for telecommunications cabling within a commercial building.

The standard covers various aspects of wiring including telecommunications outlets.

Following is the wiring standard for terminating CAT 5 cable using RJ-45 connector:
Pair 1 Pins 1 & 2
Pair 2 Pins 3 & 6
Pair 3 Pins 4 & 5
Pair 4 Pins 7 & 8





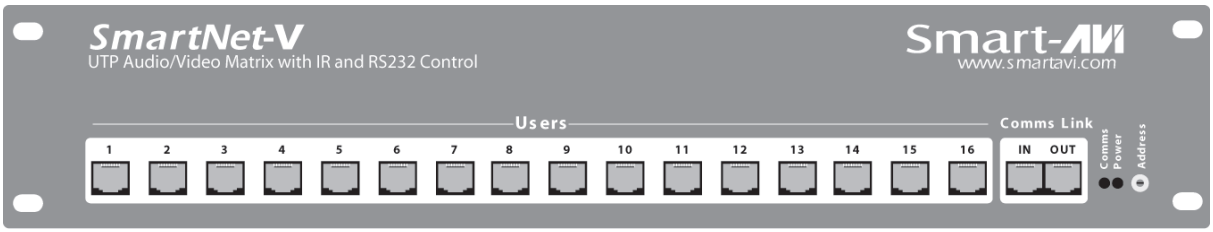
Connectors:	RJ-45
Capacitance:	14 pf/ft (46.2 pf/m)
Conductor Gauge:	24 AWG
Impedance:	100 +/- 15 ohms
	4 - Pair

Connecting the system with CAT5

On the front of your SmartNet-V unit, you'll notice that there are 16 connections for CAT5 cables. Depending on the model you have, you may be able to only use some of those connections. If you have the 16X16 unit all of those outputs will be fully functional.

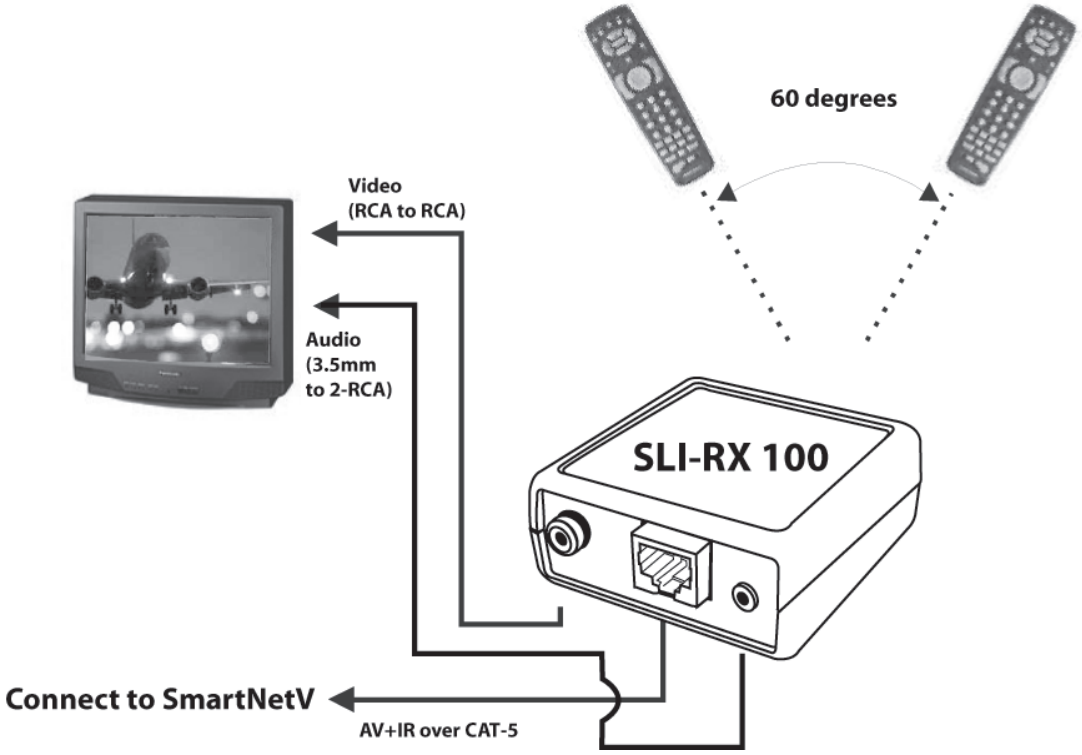
Run a CAT5 cable from the front of the SmartNet-V unit all the way to where the output monitor will be located. Again at this time it might be useful to label those connections until they are manually entered into the software. You can use one of the installation help sheets that we have included. This will allow you to write down which connections are connected to what output on the SmartNet-V unit.

It doesn't matter which output the CAT5 is connected to because it can easily be changed with the software. Just be sure to label it or write down which output is going where. You can use the sheet that is provided at the en of this manual.



Connecting Remote SLI-RX100

1. Connect CAT5 cable (coming from the SmartNet-V Unit) to the back of the receiver.
2. Connect the display monitor to the RCA out connector on the front of the receiver using a standard male to male RCA cable.
3. Connect external speakers to the AUDIO OUT connection on the front of the unit. (Standard 3.5mm stereo miniplug)



SLI-RX100 connection diagram.

System Power ON

You are now ready to turn on the system. Make sure that all connections are plugged in and all video monitors that you wish to use are connected.

1. Plug in the power adapter to the back of the SmartNet-V unit. Connect this power cord to the wall.
2. Turn computer on and make sure that the boot up process has completed.
3. Observe to see if LEDs are lit. The receiver have one LED while the SmartNet-V unit has two. One of those LEDs is for the power and the other is to indicate that the unit is functioning properly.

Find the Installation CD that came with your SmartNet-V unit. This CD has the SmartControl software that you will need in order to control the unit using a computer.

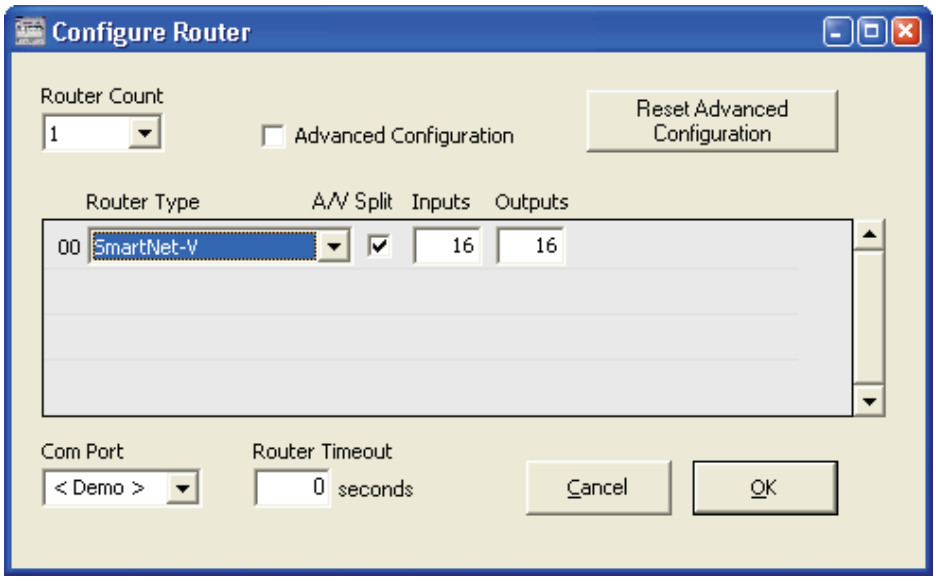
Insert the CD into your CD-ROM. On the CD you should see:

SmartControl Installer.exe
SmartControl Help File
SmartNet-V Manual in PDF format

Double click SmartControl.exe in order to initiate software installation. Click Install. After installation has completed, click CLOSE.

In order to use the software, click on the START button>Programs>SmartControl. There you should see a help file, the SmartControl launcher as well as a shortcut to uninstall SmartControl. Click on SmartControl in order to launch the software.

When the software starts you will see a screen like this.



Router Count: Select how many routers you have installed. If you have one router, continue with the following instructions. If you have multiple routers, you will want to read the section "Configuring more than one SmartNet-V Router"

Advanced Configuration: If you have more than one Router installed you will want to check this box.

Router Type: Select SmartNet-V.

A/V Split: Check this box if you need to route audio and video independently, regardless from which source they originated from. Leave unchecked if you want audio and video signals from the same input to remain together.

For example, if you wanted to route different video feeds to different locations but wanted all of them to have the same audio, you should check the box.

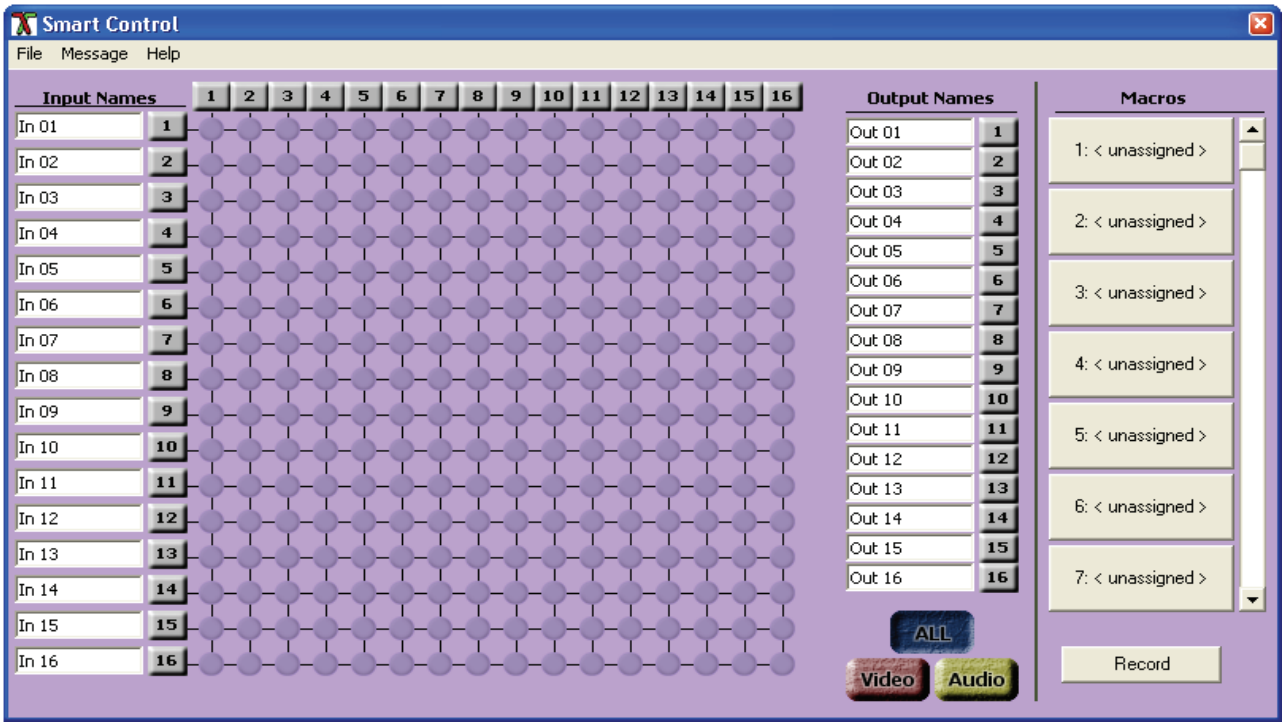
Inputs/Outputs: Enter the number of Inputs/Outputs your SmartNet-V router has. For now we will assume that there are 16 inputs and 16 outputs.

Com Port: Select the appropriate com port that your computer is using to access the router.

Router Timeout: By default this is 0 meaning the computer acknowledges commands almost instantly. Sometimes a computer takes longer to respond. This setting should be left at 0. If you need to change it, it should be no higher than 0.2.

After you have entered in the necessary information click OK.

This will now take you to the Main Routing Window where you can route the different video/audio connections.



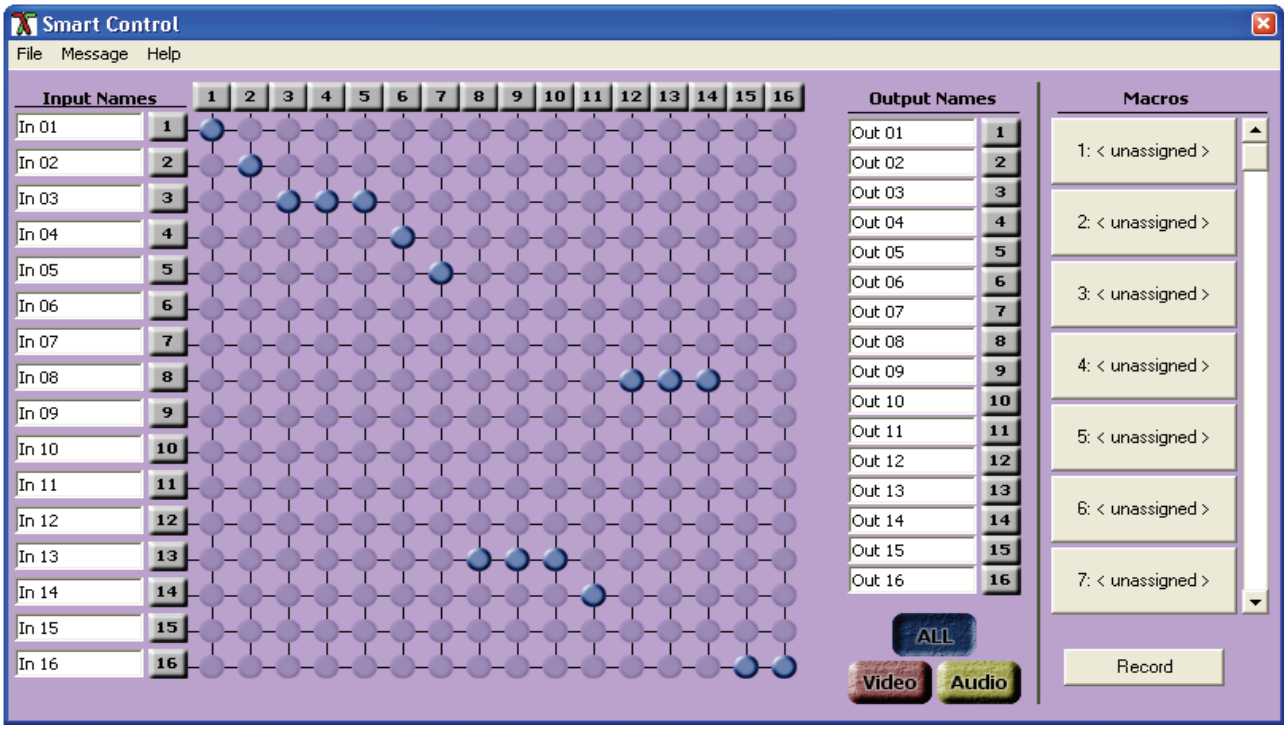
On this screen you will notice the input buttons running down the left side while the output buttons run across the top. They are each labeled 1 through 16.

Note: The three small colored buttons at the lower right labeled ALL, VIDEO, and AUDIO are not available if AV Split was not checked when you configured your router.

The Main Routing Window enables you to control the router(s) connections by means of the matrix panel, the button panel, or with pre-recorded routes called macros.

Matrix Panel: This is probably the simplest way to route the connections. Simply click on the cross point itself. The input on the left will then be routed to the output above.

Note: Inputs can be routed to several different outputs, but each output can only have a single input at any one time. So you can have several connections horizontally but not vertically.



The Button Panel: These are the numbered buttons across the top and left sides. Click an output button on the top, and then click an input button on the left.

Options for using the Button Panel

Output Options:

To select multiple outputs next to each other, click on one output, then hold the shift key down and click the last output. When the input is clicked, it is routed to all selected outputs

To select multiple outputs individually, hold the control key down and click on any number of outputs. When the input is clicked, it is routed to all selected outputs.

Input Options:

To route an input to all the outputs at once, hold the control key down and click on an input.

To leave the outputs selected after the route is made, hold the shift key down and click on an input.

Macros: This section of the window is used to save and play back macros. Macros store a set sequence of routes.

To record a macro:

1. Click on the Record button (last button shown above). A blinking "recording" message below this button will be displayed to indicate that all routes are being recorded.
2. Select the desired cross points. (See Matrix Routing for details on making these routes.) There is no limit on the number of routes you may record.
3. If you click a macro button while in the record mode, the macro will be executed, and these routes will be added to the recording. This makes it possible to combine the routes of two or more macros into one bigger macro.
4. When finished, click the "Save Macro" button. You will be instructed to then click on one of the macro buttons. Doing this will save the recorded routes to that button.

   To cancel saving the macro, click the "Cancel Save" button.

5. To play back a macro, simply click on one of the 50 macro buttons. Use the scrollbar to bring any of these into view.
6. The macros are automatically saved in the current configuration file. They are also saved when you select the File/Save Configuration... menu.

To save macros in a separate file for a special purpose, select the File/Save Macros.... menu.

Installing IR EYE

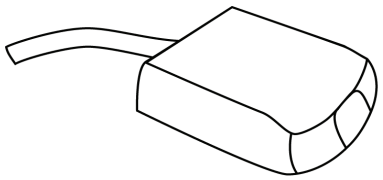
This option is available on the SLI-RX100-E receiver unit. Using the optional IR Eye provides a transparent link back to the switch. By using a standard IR handset the user can switch the video connection that is being displayed. He may switch it to any of the 16 available channels.

When the IR EYE is used in conjunction with the IR Blaster, the user can also control any of the Remote video input units.

If the user switches to a channel that has no video input, he will simply see a blank screen.

To connect the IR Eye to the receiver unit (SLI-RX100):

1. Connect the small miniplug connection of the IR Eye into the SLI-RX100 receiver unit. Make sure that it is plugged in securely.



IR-EYE

Programming your remote control

1. Press and hold the SAT button whilst at the same time holding down the OK button.
2. After approximately 2 Seconds the SAT button will remain illuminated.
3. Release both buttons.
4. Enter the three-dig it code 027. *(The SAT button will blink with each button press.)*
5. Press the SA2e button once more.
6. Your handset is programmed. The SAT button should blink three times. If it does not, a mistake has been made somewhere in the steps above.

*Batteries not included

Switching Port with remote control

You have the option of controlling the matrix via Remote Control. This remote uses the Philips RC5 IR transmission protocol and these signals can be used to manage the SmartNet-V. The SM-EYE must be connected to the SLI-RX100-E in order to interface the remote control with the matrix. This IR Eye comes preinstalled into the SLI-RX100 but not the SLI-RX100-E. When using the remote control, you are only able to control which input is routed to the receiver that it is interfacing with.

There are two ways of controlling which input is routed to the output of where the SLI-RX100 is located.

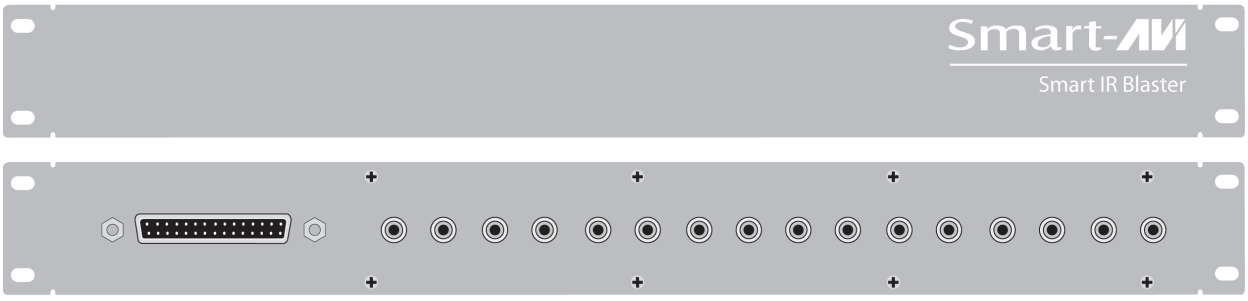
1. Using the "UP" and "DOWN" channels on the remote will allow you to cycle up one channel or cycle down one channel, respectively. For example, if the OUTPUT 1 is viewing INPUT 2, a press on the "UP" button will switch the OUTPUT 1 to INPUT
2. Pressing two digits on the remote will set the units output to the selected input that was entered in from the remote. For example, When OUTPUT 2 is viewing INPUT 4, by pressing "0"+ "6" will set the OUTPUT 2 to view INPUT 6.

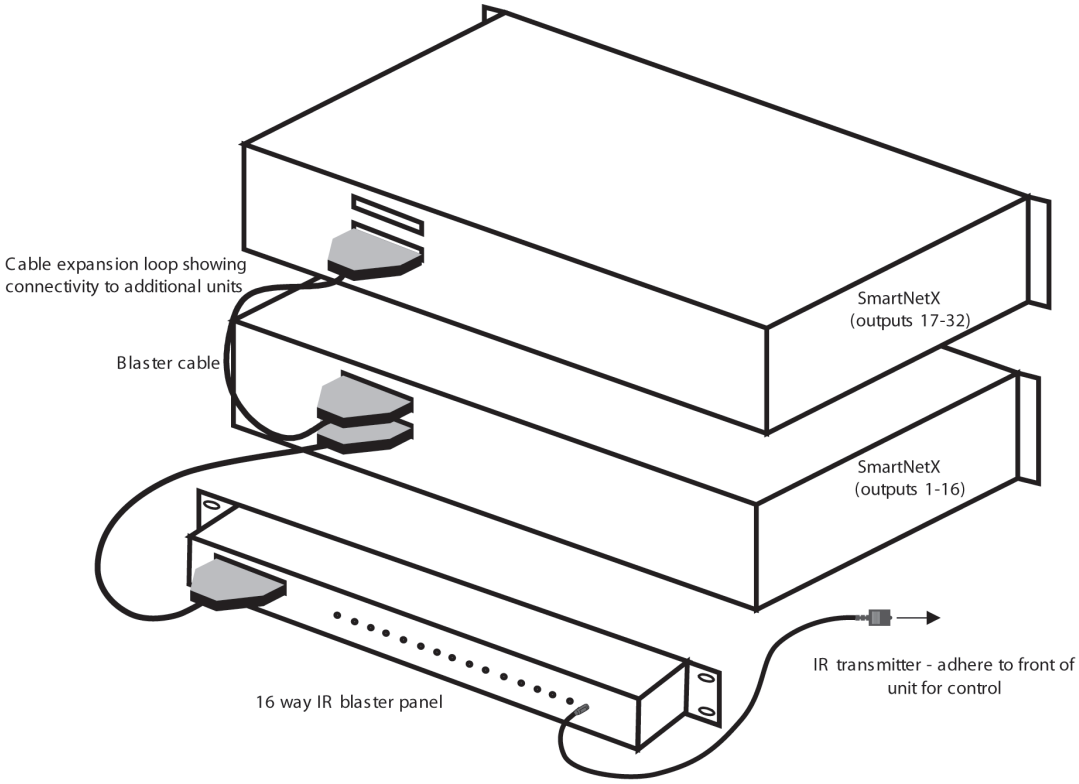
Installing IR Blaster and IR Emitter

Full IR device control is enabled when the Blaster panel is connected to the SmartNet-V. This panel allows each device to be controlled from every remote destination. The panel is supplied with 16, 2m long IR transmitters to 3.5mm jack plugs.

1. Connect the IR Blaster to the main SmartNet-V router.
2. Connect IR Emitters into the corresponding input plug on the IR Blaster. These IR transmitters are stuck onto the device you want to control making sure that they are near to the IR receiver point of the device. The switched IR feature allows multiple devices of the same type to be installed without overlap.
3. Make sure that the IR Eye is connected (for SLI-RX100-E only) on the receiving end. You should now be able to control the input units (DVD player, Satellite, etc) with their respective remote units.

Infrared control can also be maintained when expanding the system. Additional units can be linked together, cascading the IR commands through each chassis to the Blaster.





IR Blaster unit connected to SmartNet-V unit

Configuring more than one SmartNet-V Router

Many times one SmartNet-V router is enough to suit ones needs. But at times it becomes necessary to have more connections. This is when it would be necessary to have multiple routers.

There are different ways to connect the routers. We will assume there are three routers.

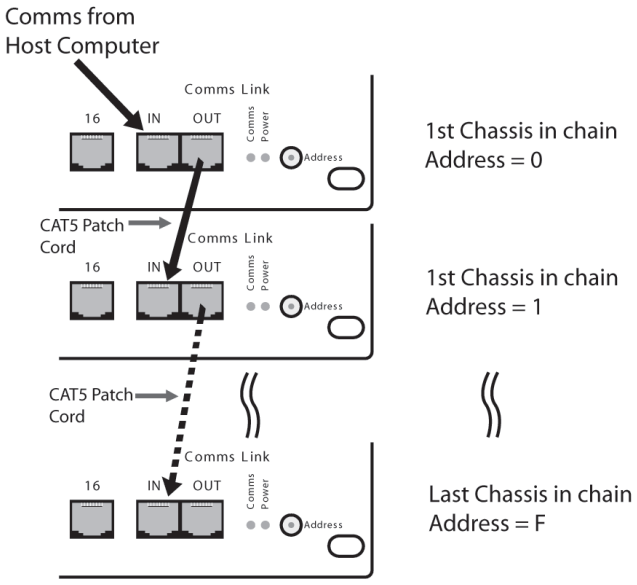
If you want to be able to control multiple routers, do the following:

The SmartNet-V Router has a small HEX dip switch to control the address. It is located on the far right of the front panel. Leave the knob at 0 for the primary router and set the additional routers on consecutive numbers starting on 1. (For example if you have 3 routers, the primary router will use 0, second router will use 1, and the third router will use 2.

After the dials are set you can connect the CAT5 cables. The primary unit will have the IN port already connected to the communication cable. Connect an additional CAT5 cable to the OUT port. Run this cable to the IN port on the second unit.

Now connect another CAT5 cable to the OUT port on the second unit and connect it to the IN port on the third unit.

Address	Hex Switch Setting
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F



Now all routers can be controlled by the computer. Remember that this configuration is used solely to control the units. Each unit remains separate and distinct. You cannot connect an input to a SmartNet-V unit and route it to the output of another unit. **Inputs and outputs must remain within the same unit.**

In the software, the settings for the SmartNet-V will be 48 inputs and 48 outputs when using three routers. SmartNet-V routers will be assigned certain numbers. The primary router (using address 0) will have inputs/outputs 1 through 16; the second router (using address 1) will have inputs/outputs 17 through 32, and so forth.
If you want to be able to route any of 16 inputs to any of the 48 outputs, do the following:

1. Complete the 3 steps found in the previous section (Configuring more than one SmartNet-V Router). This will allow you to control all of the routers.
2. Connect the Active Splitter cable to the three routers. This cable has three connections. Each of those connections should align vertically and hook up to the same input on all routers.
3. Connect the inputs into the main router. These inputs will actually hook onto the active splitter cable.

You now have 16 inputs that are available to 48 different outputs.

Chapter 5: Technical Information

Matrix Specifications

Item	Description
Video	
Bandwidth	15MHz
Input Signal Level	1 Volt pk-pk into 75R
Output Impedance	100 Ohms
Input Inpedance	100k Ohms
Connector	Composite Stadard RCA, Female
Format	NTSC/PAL/SECAM Composite Video
Audio	
Signal	20KHz unbalanced 100 Ohms Impedance
Signal Level	0 dB
Output Impedance	100 Ohms
Input Impedance	10K Ohms
Connector	RCA Jack Stereo
Looping Connector	Subminiature dB25 socket
Power	
Voltage	90-230V
Connector IEC	IEC
Fuse Rating	1A A/S
Frequency	50/60 Hz
Control	
IR	Individual Control/Open Collector to 12V dB37 socket
RS422	Dual RJ45 Sockets
Physical	
Dimensions (HxWxD)	133mmx19inx450mm
Weight (kg)	10kg

Receiver Specifications

Video	
Bandwidth	100MHz
Signal Level	1Volt
Impedance	75 Ohms
Connector	Composite Standard RCA, Female
Audio	
Bandwidth	15Khz
Signal Level	OdB unbalanced
Output Impedance	100 Ohms
Connector	3.5 mm mini jack, Female
IR	30-100 kHz modulated IR via 3.5mm jack
Power	5 x 2.1mm 12VDC 500mA
Physical	
Dimensions (HxWxD)	85 x 84 x 35 mm (2.5"x 2.5" x 1.0")
Weight (kg)	0.3 kg (.1lb)

1.0 Document Conventions

Any numbers preceded by '0x' are hexadecimal. (base 16) All data byte string listed in examples are in hexadecimal. (base 16)

2.0 Comms Ports Settings.

The Host Controller Serial Port should be configured as detailed in the table below

Baud Rate	9600
Start Bits	1
Data Bits	8
Parity	None
Stop Bits	1

3.0 RS232/422 converter.

The Frame control interface uses RS422. A full duplex 5 wire balanced communications standard that allows communications to be multi-dropped to more than one Frame.

Since PC's only come with RS232 ports a small converter is required to convert the RS232 signals to RS422.

If you purchased any of the SmartControl software options you will have received a suitable converter and cable.

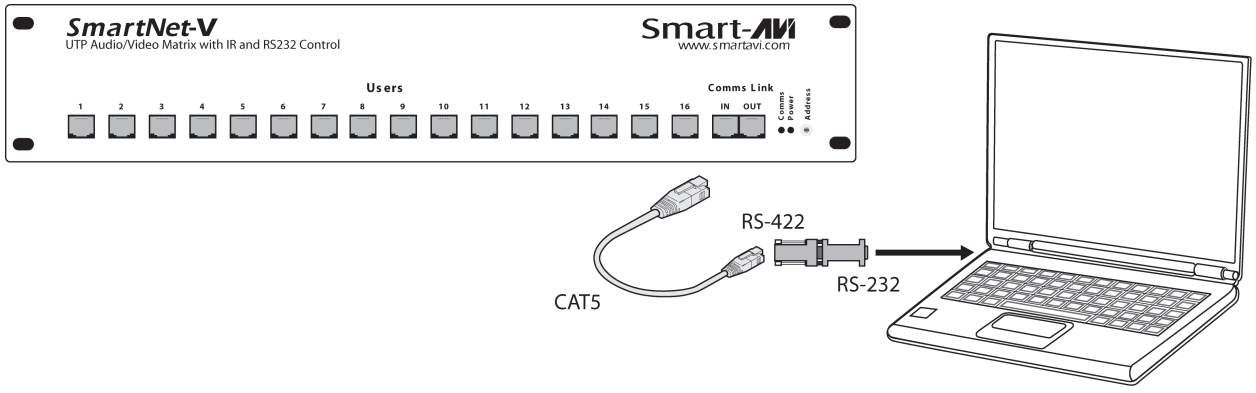
In the event that you wish to purchase your own converter and/or make your own comms cable please see Appendix A at the rear of this document for more information.

4.0 Connecting up

4.1. Plug the RS232 end of the RS232 to RS422 converter directly onto the selected comms port on the rear of your computer.

4.2. Plug the comms cable (D9 end) onto the end of the RS422 end of the RS232/RS422 converter.

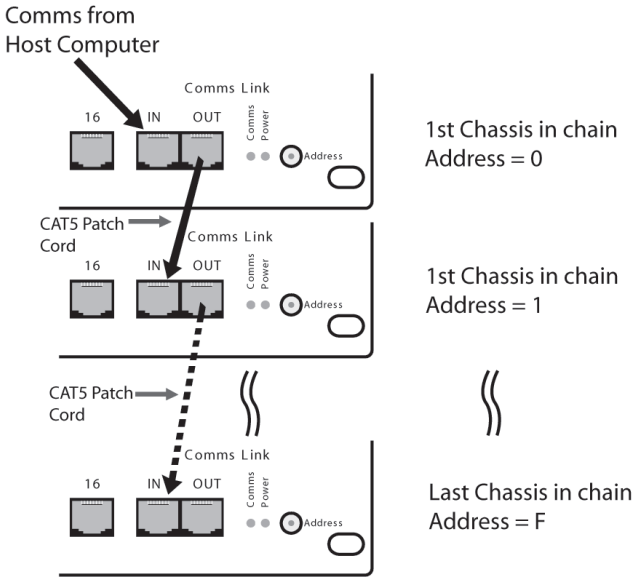
4.3. Plug the RJ45 end of the comms cable into the IN port on the front of the SmartNet-X or SmartNet-V.



5.0 SmartNet-V Frame Switches

The communications port on the SmartNet-V allows for multiple chassis to be connected together.
This is achieved by creating a loop between chassis using the comms IN and OUT ports on the front of the chassis.
i.e.

Address	Hex Switch Setting
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F



In order to ensure good communications it is essential that the Hex address switch on the front of the SmartNet-V is set correctly. The hex switch can be adjusted using a small flat head screwdriver.

An incorrect setting or having more than one chassis set to the same address will result in comms errors.

6.0 Packet Structure

The general form of packets sent to the SmartNet-V switches are detailed below;

<Header Byte 0><Header Byte 1><Frame Address><Reserved><CMD><DATA BYTES><BCC>

Where ;

<Header Byte 0>	Always 0xBE
<Header Byte 1>	Always 0xEF
<Address>	Frame address. Set by Hex switch on front of unit.
<Reserved>	Reserved for future use (Always 0x00)
<CMD>	Command byte – Determines the number of bytes in DATA BYTES
<DATA BYTES>	Number of bytes for associated CMD
<BCC>	XOR of all bytes in the string up to but not including BCC

On receipt of a valid data packet the SmartNet-V will either respond with an ACK (0x06) or a valid packet containing the requested data.

7.0 Implemented Commands @ 18/11/2003

Note: Commas shown in example byte strings below are not transmitted from the serial port they have only been added only to aid legibility.

7.1 Set Crosspoint Command : CMD = 0x00

Sets specified switch output or Destination to the specified input or Source.

Send: <0xBE><0xEF><Address><0x00><0x00><Source><Destination><BCC>

Where;

<Source>	=	Single Byte, Switch Input channel -1
<Destination>	=	Single Byte, Switch output channel number -1

Response: If successful the unit will respond with an ACK (0x06)

Examples

1. Sending the following byte string sets Source 1 to Destination 1 on chassis 0
   0xBE,0xEF,0x00,0x00,0x00,0x00,0x00,0x51,

2. Sending the following byte string sets Source 2 to Destination 1 on chassis 0
   0xBE,0xEF,0x00,0x00,0x00,0x01,0x00,0x50,

3. Sending the following byte string sets Source 2 to Destination 2 on chassis 0
   0xBE,0xEF,0x00,0x00,0x00,0x01,0x01,0x51,

4. Sending the following byte string sets Source 16 to Destination 16 on Frame 15
   0xBE,0xEF,0x0F,0x00,0x00,0x0F,0x0F,0x5E,

7.2 Send Message Command : CMD = 0x01

Writes message to specified On Screen Display.

Send:

<0xBE><0xEF><Address><0x00><0x01><Destination><OSDLine><Message>
<BCC>

Where;

<Destination>	=	Switch output channel number –1
<OSDLine>	=	Screen Line number
<Message>	=	This section **MUST** be 28 bytes long

(Please see the following text for more details on this)

Due to the limitations of both the On Screen Display and the amount of available non-volatile memory in the SmartNet it is necessary for the Host system to perform some pre-processing of the message to be displayed.

The characters in the message to be displayed need to be translated using the rules detailed in Appendix B.

Response: If successful the unit will respond with an ACK (0x06)

Examples

1. Sending the following byte string sends the text "Message" to Line 2, destination 1 of Switch 0

   BE,EF,00,00,01,00,02,18,2E,3C,3C,2A,30,2E,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,5B,

2. Sending the following byte string sends the message "Abandon Ship!" to line 6, destination 6 of switch 5

   BE,EF,04,00,01,05,06,0C,2B,2A,37,2D,38,37,0B,1E,31,32,39,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,0B,60,

Set Video Only Crosspoint

Cmd = 3
Databytes = destination, source

i.e. to switch video on output 3 to input 4

CMD = 3
Databytes = 3,4

Set Audio Only Crosspoint
Cmd = 4
Databytes = destination, source

i.e. to switch audio on output 3 to input 4

CMD = 3
Databytes = 3,4

Mute Video on specified output
Cmd = 5
Databytes = Destination, State (0=off, 1 = on)

i.e. to turn video off on output 3

CMD=5
Databytes = 3,0

i.e. to turn video on on output 3

Mute Audio on specified output
Cmd = 6
Databytes = Destination, State (0=off, 1 = on)

i.e. to turn audio off on output 3

CMD=6
Databytes = 3,0

i.e. to turn video on on output 3

CMD=6
Databytes = 3,1

Split Crosspoints - Video and Audio Differently
Cmd = 7
Not specified yet but will exist

Get Current Status
CMD 8 = current Status all
Databytes = Destination. (1-16 = specific output, 0xff = all)

i.e. to read the status of output 3 send;

CMD = 8
Databyte = 3

i.e. to read the status of all outputs

CMD=8
Databytes = 0xff

Unit will return Valid PSU as above where databytes is;
a single byte indicating currently selected source if specific destination was requested
or a string of 16 bytes indicating currently selected source for each destination starting with destination 1.

The command to make the end of CAT5 line receiver (SLI-RX100) switch between its local and remote sources is as follows;
<0xBE><0xEF><Frame Address><Reserved><CMD><DATA BYTES><BCC>
Where;
<0xBE> always 0xBE
<0xEF> always 0xEF
<Frame Address> Frame address. Set by Hex switch on unit or position in Rack frame.
<RESERVED> always 0x00
<CMD> 50 (0x32)
<DATABYTES> is Two bytes **<DESTINATION><SOURCE>** 0L = Receiver LOCAL Video/Audio, 1 = Receiver REMOTE Video/Audio
<BCC>
So if switching the Receiver on output 3 of Frame 2 to its local source send
<0xBE><0xEF><0x02><0x00><0x32><0x02><x00><0x63>

Get System Information
Cmd = 0xff
Databytes = NULL (none)

Unit will return a valid PSU as detailed above where Databytes are as follows

<product type>, <switch configuration> , <version>

Where Product Type =
1 Byte;
0 = SmartNet V
1 = SmartNet X
3 = SLX-TX550
4 = SLX-RX300

Where Switch configuration =
2 Bytes;
<inputs><outputs>

Where Version =

3 bytes
<Version><issue><release>

Appendix A: RS232/422 Converter and Comms Cable

RS232/RS422 Converter

A suitable RS232/RS422 product can be purchased from **KK Systems** in Brighton, East Sussex. It is called a **K2.**

The company contact details can be found at www.kksystems.co.uk

Comms Cable

DB9 cable ended plug	Function	UTP Wire Colours (RJ45)
1	-	-
2	RX-(A)	Orange
3	TX+(B)	White & Brown
4	0V	Blue
5	-	-
6	0V	Green
7	RX+(B)	White & Orange
8	TX-(A)	Brown
9	-	-

You will also require a cable that sits between the RS422 port of the K2 converter and the Frame. It should be wired as shown below. (Tip: Cut the end off a CAT5 Patch lead and attach a DB9 Plug)

Appendix B: On Screen Display Message Processing Rules.
Available on SmartNet-V only

Due to the limitations of both the On Screen Display and the amount of available non-volatile memory in the SmartNet it is necessary for the Host system to perform some pre-processing of the message to be displayed.

The message string needs to be parsed character by character and the values translated according to the table below.

Characters	Translation Rule	Comment
"0" Through "9"	Chr$(Asc(sChar) - 48)	Subtract 48 from ASCII value of character
"A" Through "Z"	Chr$(Asc(sChar) - 53)	Subtract 53 from ASCII value of character
"a" Through "z"	Chr$(Asc(sChar) - 55)	Subtract 55 from ASCII value of character
"."	Chr$(&H27)	Substitute the character "." for ASCII value 0x27
" " (space)	Chr$(&H0b)	Substitute the character " " for ASCII value 0x0b
":"	Chr$(&H26)	Substitute the character ":" for ASCII value 0x26
"/"	Chr$(&H28)	Substitute the character "/" for ASCII value 0x28
"""(Apostrophe)	Chr$(&H29)	Substitute the character "" for ASCII value 0x29
"-"	Chr$(&H0A)	Substitute the character "-" for ASCII value 0x0a
"?"	Chr$(&H70)	Substitute the character "?" for ASCII value 0x70
"*"	Chr$(&H5F)	Substitute the character "*" for ASCII value 0x5f
"="	Chr$(&H78)	Substitute the character "=" for ASCII value 0x78
">"	Chr$(&H7A)	Substitute the character ">" for ASCII value 0x78
"<"	Chr$(&H7B)	Substitute the character "<" for ASCII value 0x7b
"("	Chr$(&H61)	Substitute the character "(" for ASCII value 0x61
")"	Chr$(&H62)	Substitute the character ")" for ASCII value 0x62

Please see the following page for a working example of these rules in the form of a Visual BASIC function.

Appendix B: Continued..... (Sample Translation routine in Visual BASIC)

```
Function LookUpOSDString(sTextMessage As String) As String
'
' Look up chars and translate to message for OSD
'
   Dim iLoop As Integer
   Dim sNewMess As String
   Dim sChar As String

   sNewMess = Space$(MAX_SCREEN_CHAR)

   For iLoop = 1 To Len(sTextMessage)

      sChar = Mid$(sTextMessage, iLoop, 1)

      Select Case sChar
            Case "0" To "9"
               Mid$(sNewMess, iLoop, 1) = Chr$(Asc(sChar) - 48)
            Case "A" To "Z"
               Mid$(sNewMess, iLoop, 1) = Chr$(Asc(sChar) - 53)
            Case "a" To "z"
               Mid$(sNewMess, iLoop, 1) = Chr$(Asc(sChar) - 55)
            Case "."
               Mid$(sNewMess, iLoop, 1) = Chr$(&H27)
            Case " "
               Mid$(sNewMess, iLoop, 1) = Chr$(&HB)
            Case ":"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H26)
            Case "/"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H28)
            Case ""
               Mid$(sNewMess, iLoop, 1) = Chr$(&H29)
            Case "-"
               Mid$(sNewMess, iLoop, 1) = Chr$(&HA)
            Case "?"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H70)
            Case "*"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H5F)
            Case "="
               Mid$(sNewMess, iLoop, 1) = Chr$(&H78)
            Case ">"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H7A)
            Case "<"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H7B)
            Case "("
               Mid$(sNewMess, iLoop, 1) = Chr$(&H61)
            Case ")"
               Mid$(sNewMess, iLoop, 1) = Chr$(&H62)
            Case Else
               Mid$(sNewMess, iLoop, 1) = Chr$(&HB)
      End Select

   Next iLoop

   LookUpOSDString = sNewMess
End Function
```

Limited Warranty Statement

A. Extent of limited warranty

1. SmartAVI Technologies, Inc. warrants to the end-user customers that the SmartAVI product specified above will be free from defects in materials and workmanship for the duration of 1 year, which duration begins on the date of purchase by the customer. Customer is responsible for maintaining proof of date of purchase.
2. SmartAVI limited warranty covers only those defects which arise as a result of normal use of the product, and do not apply to any:

   a. Improper or inadequate maintenance or modifications

   b. Operations outside product specifications

   c. Mechanical abuse and exposure to severe conditions
3. If SmartAVI receives, during applicable warranty period, a notice of defect, SmartAVI will at its discretion replace or repair defective product . If SmartAVI is unable to replace or repair defective product covered by the SmartAVI warranty within reasonable period of time, SmartAVI shall refund the cost of the product.
4. SmartAVI shall have no obligation to repair, replace or refund unit until customer returns defective product to SmartAVI.
5. Any replacement product could be new or like new, provided that it has functionality at least equal to that of the product being replaced.
6. SmartAVI limited warranty is valid in any country where the covered product is distributed by SmartAVI.

B. Limitations of warranty

TO THE EXTENT ALLOWED BY LOCAL LAW , NEITHER SMARTAVI NOR ITS THIRD PARTY SUPPLIERS MAKE ANY OTHER WARRANTY OR CONDITION OF ANY KIND WHETHER EXPRESSED OR IMPLIED , WITH RESPECT TO THE SMARTAVI PRODUCT , AND SPECIFICALLY DISCLAIM IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, SATISFACTORY QUALITY , AND FITNESS FOR A PARTICULAR PURPOSE

C. Limitations of liability

To the extent allowed by local law the remedies provided in this warranty statement are the customers sole and exclusive remedies

TO THE EXTENT ALLOWED BY LOCAL LAW , EXCEPT FOR THE OBLIGATIONS SPECIFICALLY SET FORTH IN THIS WARRANTY STATEMENT , IN NO EVENT WILL SMARTAVI OR ITS THIRD PARTY SUPPLIERS BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHETHER BASED ON CONTRACT , TORT OR ANY OTHER LEGAL THEORY AND WHETHER ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

D. Local law

To the extent that this warranty statement is inconsistent with local law, this warranty statement shall be considered modified to be consistent with such law.

Input	Description	Output	Description
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		19	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28	
29		29	
30		30	
31		31	
32		32	